

IN THE DRAWINGS

Please **replace** FIGs. 5 and 6 with the enclosed figures. FIGs. 5 and 6 have been amended to include the legend - PRIOR ART --, which is shown in red ink.

Please **add** FIG. 7, which illustrates the present invention with a conveyor belt and disk brush. Support for the new figure is provided on page 29 from lines 1-23. No new matter has been added.

IN THE SPECIFICATION

Please **replace** the first paragraph on page 2, beginning at line 2 and ending at line 15 with the following:

A¹ For the precision processing of substrates such as glass substrates for a semiconductor wafer, a liquid crystal panel, etc., is generally performed in the following manner. Wires, an insulating film, and a film such as a semiconductor layer, etc., are formed, and the structure as desired is produced by a similar technique to the photographic printing technique, called photolithography. However, when performing precision processing by photolithography, the problem arises in that particulate contaminant (dust particles) adhering to the surface of the substrate causes defects such as disconnection, shorting, and inferior patterning, which lower the yield.

Please **replace** the paragraph beginning at line 10 on page 8 and ending at line 1 on page 9 with the following:

A² 1. Firstly, although the cleaning brush and the ultrasonic nozzle are driven simultaneously, because these members are provided on the same surface of the substrate, the brush scrubbing cleaning and ultrasonic cleaning can never be applied to the same part simultaneously. Namely, although the cleaning brush and the

A 2
ultrasonic nozzle are driven simultaneously, the brush scrubbing cleaning and the ultrasonic cleaning can never be applied to the same part on the substrate surface simultaneously. Therefore, an improvement in removing power for the fibrous particles released from the cleaning brush does not lead to an improvement in removing power for the particulate contamination (dust particles). Therefore, the foregoing cleaning apparatus cannot provide a sufficient level of cleanliness to meet the increasing demand for cleaning of an improved precision (fineness).

Please **replace** the paragraph beginning at line 9 on page 9 and ending at line 21 with the following:

A 3
The foregoing cleaning apparatus of Japanese Unexamined Patent Publication No. 86222/1995 also has the following problem. That is, in the structure wherein the ultrasonic nozzle is provided on the side of the cleaning brush, the ultrasonic wave and the aqueous cleaning agent supplied from the ultrasonic nozzle have difficulty reaching the part to be brush-cleaned on the surface of the substrate that is being disturbed by the cleaning brush. Therefore, the ultrasonic cleaning is specifically applied to the part surrounding the cleaning brush, and is hardly applied to the part to be brush-cleaned on the surface of the substrate.

Please **replace** the paragraph beginning at line 9 on page 10 and ending at line 24 with the following:

A 4
Moreover, in the foregoing cleaning apparatus, the aqueous cleaning agent and the ultrasonic wave supplied through the ultrasonic nozzle are reflected from the surface of the substrate to be incident on the surface of the cleaning brush. Therefore, in the state where the substrate is not set in the cleaning apparatus, neither of the aqueous cleaning agent nor ultrasonic wave supplied from the ultrasonic nozzle reaches the cleaning brush. Namely, in this structure, the cleaning brush is subjected to the ultrasonic cleaning only in the state where the substrate is set in the cleaning

A 4 apparatus. Therefore, the particulate contamination (dust particles) removed from the cleaning brush may be redeposited onto the surface of the substrate, which in turn contaminates the substrate surface.

Please **replace** the paragraph beginning at line 13 on page 18 and ending at line 1 on page 19 with the following:

A 5 As shown in Figure 1, the roll brush 1 includes a cylindrical brush part 1c in which a large number of fabric 1b made of polyamide (nylon) are flocked radially on a surface of a core member 1a, and a rotation drive unit (rotation mechanism) 1d to be connected to the core member 1a for rotating the brush part 1c. The roll brush 1 is arranged such that the core member 1a is positioned parallel to the plane of the substrate, and that the fabric 1b makes a contact with the upper surface of the substrate 10. The roll brush 1 scrubs the upper surface (the surface to be cleaned) of the substrate 10 with the brush part 1c that is rotated by the rotation drive unit 1d, so as to perform a brush-cleaning (brush scrubbing cleaning) of the upper surface of the substrate 10.

Please **replace** the paragraph beginning at line 16 on page 19 and ending at line 8 on page 20 with the following:

A 6 The brush part 1c of the roll brush 1 is formed in length slightly longer than the length, in the lengthwise direction of the brush part 1c, of the substrate 10 to be cleaned. Here, it is desirable that the brush part 1c of the roll brush 1 rotates in the direction of scrubbing the substrate 10 in an opposite direction to the transport direction of the substrate 10 so that the effect of cleaning can be improved. It is desirable that the rotating direction of the brush part 1c of the roll brush 1 be set so as to scrub the substrate 10 in an opposite direction to the transport direction of the substrate 10 so that the effect of cleaning can be improved. Namely, it is desirable that the rotation direction of the brush part 1c of the roll brush 1 be set in the rotation

A6 direction of the transport rollers 4. In this way, the relative speed between the roll brush 1 and the surface of the substrate 10 can be increased, which in turn improves the effect of cleaning.

Please **replace** the paragraph beginning at line 9 on page 20 and ending at line 15 with the following:

A7 The ultrasonic nozzle 2 is arranged so as to spray the aqueous cleaning agent 12 against the center of the roll brush 1. The ultrasonic nozzle 2 stores therein an ultrasonic vibrator 2a for applying ultrasonic wave onto the center of the roll brush 1.

Please **replace** the paragraph beginning at line 5 on page 23 and ending at line 5 on page 24 with the following:

A8 The transport rollers 4 transport the substrate 10 at a constant rate along the horizontal surface in a direction perpendicular to the axis of rotation of the core member 1a of the roll brush 1 while rotating on the lower surface of the substrate 10. With this transportation, the entire surface of the substrate 10 can be cleaned entirely without moving the roll brush 1 or the ultrasonic nozzle 2 in the transport direction of the substrate 10. In this case, it is not necessary to move the roll brush 1, and, as for the ultrasonic nozzle 2, it is only required to move it in a direction that is perpendicular to the transport direction of the substrate 10. Therefore, a complicated moving mechanism such as a robot arm for moving the roll brush 1 and the ultrasonic nozzle 2 interlocking with each other in the direction as desired can be omitted, thereby realizing a simplified moving structure. Moreover, it is arranged such that the transport rollers 4 can convey a plurality of substrates 10 between the roll brush 1 and the ultrasonic nozzle 2 successively, so that a plurality of substrates 10 can be cleaned successively. Here, it may be arranged so as to transport the substrate 10 by independently performing the step of transporting it into the space formed between the roll brush 1 and the ultrasonic nozzle 2 and the step of transporting it out of the

A 8
space.

Please **replace** the paragraph beginning at line 24 on page 26 and ending at line 8 on page 25 with the following:

A 9
Here, the following problem is to be considered. The longer the operating time of the cleaning apparatus, the more likely it is that contaminants collected by the cleaning brush are stored therein, which causes contamination of the substrate surface. To prevent the foregoing problem, in the conventional cleaning apparatus, a periodic maintenance is needed for cleaning the cleaning brush, for which it is generally required to stop the operation of the cleaning apparatus and perform troublesome operations.

Please **replace** the paragraph beginning at line 24 on page 28 and ending at line 10 on page 25 with the following:

A 10
In the present embodiment, the roll brush 1 is adopted as the cleaning brush for cleaning the substrate 10. However, the cleaning brush of the present invention is not limited to the roll brush, and for example, in lieu of the roll brush 1, a disk brush 19 (disk-shaped brush) having a rotation mechanism for rotating the disk 19 about the vertical rotation axis, which is to say rotation in a plane parallel to the plane of the substrate 10, may be adopted. See, e.g., FIG. 7. In the case of adopting the disk brush 19, it is preferable that the horizontal moving mechanism be provided for moving the disk brush 19 in the horizontal direction along the surface of the substrate 10 so that the entire surface of the substrate 10 can be cleaned.
